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THE

Journal of the Society of Arts,

AND OF

THE INSTITUTIONS IN UNION.

110TH SESSION.] FRIDAY, OCTOBER 7, 1864. [No. 620. VOL. XII.

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BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE—BATH, 1864.

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STATISTICS OF THE NUMBER AND OCCUPATIONS OF FOREIGNERS IN ENGLAND.

Professor Levi read a paper on this subject before section F. He traced the position of foreigners in this country from past times to the present, when there was a blending of citizenship, the approaching of states one towards the other by the almost annihilation of distances owing to the application of steam-power as a means of locomotion both by land and sea, and the electric telegraph. According to the last census there were 84,090 foreigners in England and Wales, being at the rate 0·041 to every 100 natives. That, however, was considerably less than the numbers in France or the United States. In France, in 1861, there were 506,381 foreigners in a population of 37,386,313, and in the United States, in 1860, there were 4,136,175 foreigners out of a population of 27,489,461. Of the 84,090 foreigners in England and Wales 73,500 were Europeans, 9,500 Armenians, 500 Africans, and 500 Asiatics and natives of other countries. Of the 73,000 Europeans, 30,000 were Germans, 13,000 were French, 5,500 were from Holland, 4,500 from Italy, 5,000 from Norway and Sweden, 5,000 from Russia and Poland, 2,000 from Spain and Portugal, 2,000 from Belgium, and 2,500 from Denmark, and about 1,000 from Greece and Turkey. Fully one-half of the foreigners in England and Wales are located in London. Of the total number of foreigners in this country, 57,000 are males and 27,000 females; and of the 73,000 Europeans, 13,000 were under 20 years of age, but it was not to be supposed that they were all organ boys. Professor Levi proceeded to enumerate their occupations, and went on to show that England had been slow in appreciating the benefit of attracting foreign industry to her shores, and showed that though many of the disabilities that existed against aliens had been removed they were still prohibited from becoming members of the Privy Council, and from sitting in the House of Commons, in deference to national susceptibilities. In France and the United States a more liberal principle is adopted. In conclusion, the Professor said there was something inherent in man which attaches him to the country of his birth, and which he cannot shake off, wherever he may dwell; and we may derive solid and valuable instruction from the study of those who are constantly round us, and who in their own persons exhibit to us all the peculiarities, habits, and manners of many distinct races and nations.

THE PATENT LAWS.

In Section G (Mechanical Science) Mr. T. Webster, F.R.S., read the report of the Committee on the Patent Laws, of which the following is an abstract:—The committee was appointed at the York meeting to inquire into the operations of the patent laws. The report set forth that the Patent Law Amendment Act of 1852 had introduced a great many alterations highly beneficial to the public, but that there still remained many objections, some of which actually arose out of the new patent law itself, and which required to be removed. It was especially necessary that a check should be put upon the issue of unnecessary or useless patents, and that all litigation in respect to patents should be left to the decision of skilled assessors, instead of being decided upon, as at present, by a common-law judge and a jury. It was expected that the report of the Royal Commission, presided over by Lord Stanley, would be one entirely in that direction. Having referred to the suggestions of Mr. Dillwyn's Committee with respect to the Patent Law Library and Museum, and the proper application of the fees, the report condemned the structure as being altogether unsuited for the collection of the patents as records of the inventions of the nation, and recommended that the fees, instead of being made contributory to the general revenue of the country, should be devoted to providing better accommodation for the reception of inventions. The working of the Act of 1852 was very beneficial, as, owing to the system of periodical payments, those patents which were of no value were allowed to fall through, the inventors finding that the protection was not worth the price they had paid for it; while, on the other hand, those who patented inventions of real utility had their property in them fully secured. The objections of those who were opposed to the existence of a patent law at all, were founded on theory rather than on fact. They alleged that such a law discouraged inventors; they had not yet brought forward any instance of it.

PRODUCTION OF COLD BY THE EXPANSION OF AIR.

In the Chemical Section Mr. A. C. Kirk read a paper on "The Production of Cold by Expansion of Air." He said:—The yearly increasing demand for ice in the tropics, where it has become all but a necessity, has not only created a most extensive traffic with the Northern States of America, but, by stimulating ingenuity, has led to the invention of several practicable machines for its artificial production; and already in this country these machines are becoming useful assistants to the manufacturer, making him independent of the natural variations of temperature, and enabling him to conduct some operations all the year round that formerly could only be carried on in winter. Though it is the object of this paper to describe a refrigerating machine in which incondensible gas—in practice atmospheric air—is employed, it may help to make the whole subject more clear if we briefly look at the principle and action of the earlier machines in which condensible vapours were used. The nature of the fluid used necessarily determines, to a great degree, the arrangement of such machines; but in all, whatever fluid be employed, or however arranged, a certain close relation to a motive power heat engine may be observed. In such engines there is always what may be called a hot and a cold end; at the hot end heat is absorbed, a part of which is rejected at the cold end, while part is converted into motive power; and the amount thus usefully employed is proportional to the difference of temperature between the hot and cold ends. If these temperatures become equal, no power will be given out by such an engine, and, but for friction, no power would be required to drive it; but if the temperature of what was originally the hot end be still further reduced, and an attempt made to drive it, power will be consumed. As a familiar example, take the case of an ordinary condensing steam-engine, with a surface condenser; and, to make the illustration more plain, we will suppose that we have no natural means of keeping the condenser colder than 200° Fahrenheit. Here the boiler is the hot end, which absorbs heat from the fire, part of which is converted into motive power, and part rejected, being carried off by the cold water used in the condenser to condense the steam. If we now allow the fire to die out, and suppose no friction to retard our engine, when the temperature of the boiler becomes the same as that of the condenser, the engine will stop, for then the pressure of steam in the boiler acting on one side of the piston will be equal to the back pressure in the condenser acting on the other. Let us suppose that we now again set our engine in motion this time by driving the crank, the piston working in the cylinder will, by removing the boiler, after the manner of an air-pump, cause evaporation to take place at a temperature lower than that of the condenser, while on its return the piston will, by forcing the steam into the condenser, raise its temperature to 200 degrees, at which we have the means of condensing it. This condensed water being returned to the boiler, the circle of operation is complete. The temperature at which water boils so limits the cooling power of such a machine as to render it practically useless; but it is obvious, that if for water we substitute a fluid with a sufficiently low boiling point, we shall convert what is described as an illustration merely into a practicable machine. Two fluids are in practical use, sulphuric ether and liquefied ammoniacal gas; but as the machine in which ether is employed sufficiently illustrates the principle, and has been longest known, I will in a few words describe the operation. Ether is contained in a small air-tight tubular boiler, connected by a pipe to a cylinder and piston, with suitable valves, by which the vapour, as fast as it is formed, is abstracted from the boiler, at a pressure as near a vacuum as possible, under which circumstances ether boils at a temperature little above zero, abstracting heat to maintain its evaporation from any fluid, generally a current of brine, that may be caused to flow through the tubes in the same way that the hot gases of the fire in a steam boiler supply the heat necessary to maintain steam. On the return stroke of the piston the ether vapour is ejected from the cylinder, and forced into a tubular condenser at a pressure about that of the atmosphere, by which its temperature is so much raised that it may be condensed by such water as can conveniently be got. The condensed ether flows by a small pipe back to the boiler, where it is again evaporated, and so on, continually. Such a machine was in use for fully a year, at the works of Messrs. Young and Co., Bathgate, for cooling the paraffin oil of which they are the well-known makers, in order to extract the solid paraffin it contains, a substance of great value in itself, and whose presence in the oil is otherwise undesirable. This machine proving too small for the increasing size of the work, and the use of a material so volatile, inflammable, expensive, and in all respects so dangerous as ether, being a serious drawback, I was requested, in the beginning of 1862, to try if some efficient substitute could not be found. Atmospheric air being the substitute which at once suggested itself to me as not only safe but inexpensive, I commenced a series of experiments, which at last resulted in a small model, by which I was able to freeze mercury. A large machine was immediately proceeded with, which worked so satisfactorily that the use of the ether machine was discontinued, and this year at the same works a more powerful one has been erected, capable, if applied to such a purpose, of making three tons of ice in twenty-four hours. I shall now proceed to describe the nature of this machine, which, it will be seen, is allied to the air-engine in the same manner as the ether machine is to the steam-engine. If we enclose a quantity of air in a strong vessel, into the top of which we fix a common air-syringe, and force the piston downwards by hand, we shall compress the enclosed air, which, by the power so spent, will be heated; and if we now cool the whole apparatus down to its original temperature, and allow the air to force the piston gradually back, the air by the effort will be cooled; but, inasmuch as the cooled air will not occupy the same space as the air originally did, the piston will not return to the point at which it was when we commenced, and thus less power will be given out during the expansion of the air than was spent in its compression. It is not necessary that the air be at the atmospheric pressure; if air of greater density be employed, the cooling power of the machine will be increased. We have thus got an elementary cooling machine, and as before power is spent in working it. To render this a practicable machine, the first thing necessary is to perform the compressing or heating operation, and the expansion or cooling operation in separate compartments; the one surrounded by water to abstract the heat generated, and the other surrounded by the substance to be cooled, or from which heat is to be taken. The one compartment being thus very cold and the other comparatively warm, the next thing is to provide means by which the air can be continually transferred from one to the other, without carrying heat from the hot compartment to the cold. Thus, if the temperature of the hot compartment be 70°, and that of the cold zero, the air must enter the cold compartment preparatory to expansion at a temperature as nearly zero as possible, and in returning to the hot compartment must enter it preparatory to compression, at a temperature as nearly 70° as possible. That beautiful invention of Stirling, the regenerator, or respirator, as it is sometimes called, composed ordinarily of a large quantity of wire gauze, through which the air passes, enables us to accomplish this very perfectly. When the machine is fairly a-going, the layers of gauze next the cool compartment become as cold as the compartment itself, and those next the hot compartment as hot, while the layers between those shade off through the intermediate grades of temperature. Thus the air, in passing from the hot to the cold compartment, warms the gauze and is itself cooled, and the cold air in returning is gradually warmed, cooling the gauze in its course; and although the air is continually being passed backwards and forwards from the hot compartment to the cold, and *vice versâ*, no heat is conveyed by it from the hot end to warm the cold and interfere with the cooling power of the air during expansion. By the help of the diagrams, Mr. Kirk then explained the arrangements by which this was carried out. He concluded by saying that the advantages attending the use of his machine were, that no expensive or dangerous fluid was employed, which gave so little trouble, that the first machine worked for four months without being touched. Mr. Kirk, at the request of the meeting, gave some explanations of parts of his machine which had not been understood, and those explanations fully satisfied the meeting of the practical utility of the machine. He further stated that the cost of the machine, without boilers, was £700.

Professor Miller was glad to hear the machine had been practically successful. The inventor had employed a new principle in a new, simple, and effective manner.

PROPOSED ART RESULT SOCIETY.

By C. BRUCE ALLEN, Architect.

The object of this proposed Society would be to bring again into practical operation the time-worn way of Art production by the *hand* as well as the mind of the artist.

Art has been defined by Ruskin to be man's delight in nature's works. Art may also be defined as the effort to copy in the unformed materials of the earth nature's works through the mind and by the hand of each individual artist. All genuine works of art are thus, like pictures, copies more or less perfect of nature's works, individualized and impressed with the individual Art feeling of each artist, through and by the combined operation of the directing mind and executing hand. Art is the handwriting of the artist in material written on useful things.

All the old art was produced in this way, and was simply the expression of the wants and feelings of the old artists in material, impressed on useful objects, and thus utilized and made common public property.

But that which strikes the modern observer most in looking at a work of antique art, whatever its nature, whether wrought like the Runic ornament, or of the highest order of refinement and finish, as the honeysuckle ornament on Greek fragments, is its expression of *individuality*. Like the hand-writing of a man, we can see, and are quite sure, that the same artist who invented or copied from some natural object the design, himself and with his own hands, executed the work. It is in picture painting only that this time-honoured mode of producing works of fine art in these modern days is practised through necessity. Pictures are therefore now the only products of fine art wherein the public see in its fulness and completeness the whole strength of the artist. In pictures alone do we see the artist workman and the signature of his hand.

It is for the express purpose of enlarging the range of this old and only perfect way of calling forth and utilizing the Art strength of the time that this proposed society should work. As a perfect art result may be defined as a useful object impressed with the art feeling of the artist for the beautiful wrought with his own hands, it should be the object of this society to endeavour to extend this great principle of Art action from painting, as its sole modern exemplar, to sculpture and the details of architecture, as well as to the ordinary objects in common and daily use as furniture and its ornamental details.

The necessity of some new mode of Art-action will be seen the more readily by contrasting the modern system of Art production, as now everywhere practised, with that which it is now proposed to encourage.

A work of Art in these days is not in reality an Art work at all, *i.e.*, a work of utility executed by an artist, but a work of manufacture—a work of utility executed not by one man but by a number, more or less, of hands, following each other successively as the work proceeds to completion, and these hands changing as the different and necessary pauses in the work admit. Thus in Glass Painting the original idea or sketch, the cartoon or working drawing, and the actual glass are by at least three artists or workmen. Sometimes very many more will be found to have been employed successively in the production, not only of an entire window, but each individual piece of the window and quarry will have passed through the hands of several artists and workmen, that is, will have been manufactured, like a pin or a nail, and thus be the work, not of any one artist, but of that strictly modern Art-destructive process by which one artist is made to entirely nullify the work of another. In the production of a picture on canvass this process is impossible, the whole work is by one artist from first to last, the original sketch or idea, the drawing and outline, the colour and painting, and the final finish; it is impossible to manufacture a picture. Now the sole difference between a painting on canvass and a painting on glass is in the nature of the material on which the colours are laid. Hence modern painted glass has in reality no artistic value, and, by the side of the old glass, may fairly be likened to a chromo-lithograph by the side of a genuine oil painting.

It will be the business of this society, if established, to endeavour to revive and encourage the old-fashioned Art process of the production of figures and ornaments on glass by one artist, and to regard each quarry as a picture, each quarry at least being the signature and handwriting of one man.

In the art of Sculpture, again, as now practised, this modern process of manufacture is made to accomplish its most unfortunate and art-killing work; the idea and clay model, and the actual stone or marble carving, are each by distinct artists and workmen, a *machine* doing the intermediate duty of indicating on the marble the artist work on the clay. Thus our modern statues and figures are lifeless models, for the real and effective power of the artist sculptor consists in the direct rendering in stone or marble with his own hands the Art idea in his brain, and which his own hands only can interpret. To breathe life into marble the sculptor himself alone is able, *hand* and mind together.

It would be the vocation of this society therefore to advocate and encourage the antique mode of carving and sculpture by the hand of the designing artist himself, whether an artist workman or a sculptor, whether a simple ornament or a figure. It would try to revive the oldest of all Fine Art work, viz., hand-writing on stone, as in Egyptian work.

In Architecture, the parent of the Fine Arts, this society would seek to encourage among architectural students the plan, as pursued by Inigo Jones, Wren, Pugin, and Barry, of each architect himself drawing the full-sized details of buildings, mouldings, and ornament, thus creating an architectural hand-writing, and a consequent expression of the individual Art feeling of the architect.

In common objects, as in furniture, paper-hangings, woven fabrics, metal work, jewellery, glass, china, book-binding, and others, as practised by the Art-workman in the Art factories and shops, it would be the express vocation of this society, and of other societies which might possibly arise from it—each one taking up a distinct speciality, such as book-binding—to ask from our Art workmen employed in these several Art trades specimens of each man's skill in that special Art trade, such specimen to be his entire work, thus evidencing to the full both his artistic and manipulative power. To obtain from the workman proofs and examples of his ability as an artist would thus be the great and constant aim of the Art Result Society. It would thus individualize the workman, and help to give to the world each man's signature.

It would thus be the province of this society to imitate the old method—that which has given us moderns all old Art of whatever date, country, or style—of Art production by the hand and head of the working artist; but as the method of Art production in the present day confines the executive workman to his work, and so necessitates the additional aid of the artist draughtsman and designer to indicate his work for him, that is, to provide him with the working drawing of the object whatever it is, whether a roof truss or a jewel, it should be one of the leading objects of the proposed Society to notice and encourage, side by side with the workman, the artist draughtsmen who do this—a class of men now unrecognised and utterly unknown to the public.

The mode of doing this would be by asking from such Art draughtsmen designs and working drawings of any set of common objects, of which specimens are to be seen in the shop windows, and awarding prizes to those competitors the Artist Council of the society might deem most worthy and suitable. In the following year these premiumed designs and drawings would be offered to the workmen in competition, to be worked from by them in the production of the object itself in the material of each workman's art trade, these when premiumed, would be publicly exhibited side by side with the drawings, thus to evidence at one and the same time the skill of the designer and the draughtsman, and the skill of each individual executive workman.

It would also be the aim of the society to ask of the artists of the day examples of their practised and more learned skill in material; as for example, an Art subject etched on metal, wherein the ordinary Art practice of the artist on paper or canvass is combined with the Art practice of the workman in material, as may be instanced and examples found in the works in niello, where Fine-Art workmanship in perfection may be seen. It would ask also of our painters painting on glass.

It will thus be seen that the special work of the Art Result Society is not at present being attempted by any existing Art society; that its highest aim has been hitherto in modern days unattempted and almost unthought of; that the method will not be new, but old; and that it simply seeks to work into common things what is now only to be found in paintings; and that it would but simply obey that great law of art, nature, and necessity which compels the painting of a picture by one workman and one only, and which will always equally compel the Art production of the commonest object by one workman, and one only. It is the price which nature demands for Art, and which must ever be paid for it.

And it would be encouraged in its work by the consciousness that the Art faculty of the present time is as great as it ever was, as is proved in the works of Millais in painting, Marochetti in sculpture, and Ruskin in leaf drawing, and in the accidental efforts of some of our Art workmen, as seen here and there in Pugin's works and in Barry's Westminster work.

It would simply seek to accomplish for the many what the Royal Academy now does only for its painters.[*] As an independent and distinct society, if divided into sections, each taking cognisance of a single art trade, or as the Art Result Department of the Society of Arts, it would need for its Art action but a very simple apparatus, and but a moderate annual fund.

A gallery or room would be required, in which should be exhibited, for the inspection of Art workmen and students, to assist them in the due comprehension of real fine art workmanship, a small collection of specimens of objects or casts appertaining to the art trades proposed to be specially encouraged. There should also be shown in this room, by way of comparison with these, choice specimens of the Art manufactures of the day, to be selected from the shop windows, and to be occasionally changed as the fashion of the time changed, for the purpose of specially instructing the student in the nature and mode of production of the Art results in material and in Art as now applied to common objects in the art manufactories, and in works of modern fine art manufacture. It would be in the midst of these examples of old and new art products that the works produced by the artist draughtsman and artist workman would be publicly exhibited, for the purpose of instructing the public mind in the distinctive difference between the modern art as now manufactured, and the same modern art as it would be when the production of the individual artist workman.

A small collection of casts and objects of antique art have already been acquired towards this end, and some liberal promises of modern specimens have been made for the purpose of evidencing the present mode of Art manufacture. A collection has also been made of *working drawings*, by artist workmen, to evidence the present capacity of the workmen, and to show precisely what such detail drawings are, and their practical utility and application.

This collection should be confined strictly to actual objects or casts, whether architectural or otherwise, and to working drawings, and all models, sketches, lithographs, engravings, photographs, and mere *representations* of objects rigidly excluded, as it is to be feared that these have a tendency to distract the attention of the student from the real Art-workmanship itself, as seen only in the object, and from its only means, the working drawing, as its sole true interpreter to a workman. The Art Result Society would be a practical School of Art.

Class lectures should be instituted for the students and workmen in Art as applied to architecture and manufacture. These lectures would be of the kind usual in the University and King's Colleges, not popular lectures.

Members and Art workmen would have at all times the opportunity of studying the collection and attending the class lectures. But in this Art Result Society, as in others, it is hoped that the fact of doing something to encourage genuine Art-workmanship would induce many to lend a helping-hand who could not well benefit from it directly, when it is considered that the mode of action is entirely new in modern days; that its plan of Art action is now confined exclusively, and without a single exception, to painters and picture-painting, and that by its proposed mode of directly employing the Art faculty and manipulative power of the artist, whether student or workman, directly on the object itself, it would add all that value to such objects which is now to be found only in old Art, and in what are called *curiosities*.

Proceedings of Institutions.

Hitchin Mechanics' Institute.—A meeting was held in the library of the Institution, on the 14th September, to distribute certificates to those who had passed successful examinations, and to consider whether it would not be desirable to form a union between the local societies of this nature. The Rev. Lewis Hensley occupied the chair, supported by Harry Chester, Esq., Joseph Sharples, Esq., C. Times, Esq., J. Pollard, Esq., &c. The Chairman having explained the objects of the meeting, Mr. Harry Chester rose and said that it was not the first time he had been to Hitchin, but he had come before them when their society was not in such a flourishing condition as it was now; he was pleased to see that they had a fine building, large rooms, and an excellent library, and also that in carrying out their scheme they had entered into union with the Society of Arts. He was also pleased that the Hitchin society had taken part in the examinations, but he observed that they had but few candidates, yet those few appeared to be successful. There was now established in London what ought to be established in Hitchin, namely, a Local Union of Institutions. It would be found to be as desirable here as in other parts of England where it had been adopted. These district unions could assist in holding minor examinations and bringing the students forward until at last they became eligible as candidates for the prizes given by the Society of Arts. What he had proposed was a union of societies throughout the whole county of Herts; the county, perhaps, was not sufficiently forward to carry out this now, but Hitchin appeared to him to be a very spirited place, and Mr. Pollard and others would meet with encouragement if they were to form into a union, say the district of North Herts and South Beds, making Hitchin the central institution. He then presented the certificates. Mr. J. Pollard read letters from the Institutions at Hertford, Royston, and St. Albans: Mr. Strickland was present from Stevenage and no reply had been received from Luton. The letters expressed a wish for the societies to receive a report of the meeting, and to be informed as to the advantages to be derived from a union such as had been proposed, and how it would affect them. Mr. H. Chester said that in the unions established they never interfered with the management of each individual society, but the object was to co-operate together for the general good of all. The great thing was to get a competent visiting officer, some such person as a certificated schoolmaster, who would visit each society, form lists of lecturers, &c. He found that the life of a union was comprehended in their visiting officer. Mr. C. Times proposed "That a sub-committee be appointed to consider the expediency of forming into a union the Hitchin and the neighbouring Mechanics' Institutions, and report to the general meeting." Seconded and carried unanimously. A committee was appointed. The Chairman then proposed a vote of thsnks to Mr. Harry Chester, seconded by Mr. J. Pollard, and carried unanimously.

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[*] It may be useful to remark that in this proposed mode of asking of the individual workman the result of both his *hand* and mind labour, the ever-growing and necessary help of machinery is not to be forgotten, in the stamping, printing, and *reproduction* of Fine Art works, as woodcuts, coins, paper-hangings, book covers, and the like. The proposed system is intended to powerfully influence the *original* woodcut, die, or wood block, works that, to be of any Art value, must be by a single artist hand. Pictures and painted glass cannot be thus multiplied.

Lancashire and Cheshire Association.—In the Education Department of the Social Science Association, held at York last week, a paper was read by Dr. Pankhurst on "The Association of Lancashire and Cheshire Mechanics' Institutes: its Objects and Operations." The following is a summary:—This organisation is founded upon a sense of the advantages of concerted action. The chief objects of the Association may be shortly stated to be—1. To equalise the educational facilities and opportunities of the several districts. 2. To establish modes of procedure which, while uniform in essentials, may be sufficiently flexible to the needs of particular localities. 3. To help Institutes to make provision for a regular course of instruction by a connected system of classes. 4. To afford opportunities to the Institutes to secure competent teachers in classes. 5. To supply information upon and make arrangements for conducting examinations of the members of the Institutes. 6. A special examination of an elementary character. 7. Increased incentives to members of Institutes to submit to examination by special prizes publicly presented. 8. To furnish assistance by the periodical visitation of a duly constituted agent. In addition to a number of vice-presidents and a general council, the practical working is directed by an annually-elected executive. A visiting agent is employed, whose time is exclusively devoted to the promotion of the educational interests of the Institutes, which are distributed into groups. An itinerating library is provided, to which it is intended to add an itinerating art-exhibition. A list of paid and honorary lecturers is furnished, to which it is proposed to add a list of paid and honorary teachers. Facilities are afforded, by the formation of local boards and otherwise, for conducting the examinations of the Society of Arts, the Department of Science and Art, and other examining bodies. The number of Institutes in union is 86. The Association has conducted these examinations during the past year. The elementary examination is intended for candidates between the ages of 12 and 16 years, and for candidates above 16 years of age who, from the insufficiency of their elementary knowledge, are not qualified for admission to the final examination of the Society of Arts. In working these examinations it was determined—1. To use the papers prepared by the Central Committee of Educational Unions. 2. To appoint a board of examiners to estimate the value of the answers of the candidates. 3. To give prizes to the most successful candidates. To the examination of the Society of Arts 25 Institutes sent in candidates. Science classes in connection with the Department of Science and Art have been in operation in seventeen localities. It seems evident that the labours of the Association should be energetically directed towards giving prominence to three points in the working of the several Institutes, viz., 1. To press upon each Institute the great importance of founding such a system of classes as shall place within the reach of every member the elements of a sound and useful education. 2. To urge the application of the most earnest efforts to introduce into all branches of the elementary instruction the utmost possible soundness and accuracy. 3. To assist in arranging in every district for the employment of one or two efficient teachers to itinerate through the several parts of the district. That teaching power which any single Institute would be quite unable to provide by its unassisted efforts, becomes easily procurable when several Institutes are so grouped together that there may be a mutual participation in benefits and burdens.

Yorkshire (West Riding Educational Board).—The prizes, certificates, and medals awarded to candidates at the Examinations of the Universities, the Society of Arts, and Department of Science and Art, as well as the Elementary Examinations conducted by the West Riding Educational Board, were presented on the 21st September, in the Leeds Town Hall, by Sir S. Northcote, Bart., M.P. Upon the platform were Mr. J. S. Pakington, Mr. Henry Cole, C.B., Mr. Beecroft, M.P., Mr. Titus Salt, Rev. Canon Atlay, D.D., &c. During the evening, Dr. Spark performed a selection of music on the organ. Mr. Barnett Blake read the report, from which the following are extracts:—The special object for which the West Riding Educational Board was established was the extension of the principle of examination as a test of the results of education among all classes of the community, both in Leeds as the centre, and in all parts of the great county of York. Since the publication of the last report numerous examinations have been very successfully conducted by the Board. In October, the local examinations for the University of Durham were held in the Town Hall, Leeds. There were eleven seniors and fifteen junior candidates, from Leeds, Tadcaster, York, Harrogate, and Hull; and of the eleven seniors three obtained second-class and six first-class certificates, with the title of Literate, and two passed. Of the juniors three obtained third-class certificates, and six passed. In December the examinations for the University of Cambridge were held. There were four senior and twenty-four junior candidates from Leeds, Wakefield, Bradford, Cleckheaton, York, Harrogate, Pontefract, Woodhouse Grove, Boston-spa, Tadcaster, Giggleswick, Stockton, and Morpeth. Of the senior, one obtained a first-class certificate, and two satisfied the examiners. Of the juniors, six obtained first-class, six second-class, and two third-class certificates, and four satisfied the examiners, being by far the largest proportion who obtained honours of any place in the kingdom. In January the only provincial matriculation examination for the University of London was held in Leeds. There were twenty-four candidates from Leeds, Bradford, Halifax, Huddersfield, Otley, Scarbro', Tadcaster, Hull, Wetherby, Thirsk, Manchester, Liverpool, Accrington, Wigan, Birmingham, Wolverhampton, and Bury. Of these, seven passed in the first-class, nine in the second-class, and one in the third-class. In March the elementary examinations in connection with the Society of Arts, and under the management of the Board, were held at Leeds, Acomb, Eccleshill, Eston Mines, Farnsley, Hebden Bridge, Hunslet, Idle, Keighley, Marske, Middlesbrough, Ossett, Queensbury, Scarbro', Slaidburn, Stocksbridge, Stockton, Thirsk, and Wilsden. There were ninety-five senior candidates, of whom fifty-nine obtained certificates, and two hundred and seventy-one junior candidates, of whom one hundred and ninety-one obtained certificates. For these examinations twelve prizes for seniors, and thirteen prizes for juniors were given by this Board. The examinations of the Society of Arts were held in April, and there were twenty-five candidates; and those of pupils of Science Classes for the Department of Science and Art commenced on the 2nd of May, and concluded on the 4th of June. Thirty-three candidates were entered. The local examinations for the University of Oxford were held at the end of May and beginning of June. There were eleven senior and fifty-three junior candidates from Leeds, Woodhouse Grove, Fulneck, Halifax, Pontefract, Doncaster, Bramham, Thorparch, Boston-Spa, Harewood, Beverley, Scarbro', Sheffield, Burnley, and Newcastle-on-

Tyne. A second half-yearly examination for matriculation in the University of London was held in the Town Hall in June last. There were thirteen candidates, and nine of them were successful. Abundant evidence has thus been afforded of the extent and value of the work which is being done by the West Riding Educational Board, and the important aid which is given to the promotion of the education of all classes on the only sure basis of sound instruction.—The Chairman said that it appeared from an account of the results of the Oxford University examinations, that while in 1858 only 37 per cent. of those who presented themselves for examination satisfied the examiners, in the present year no less than 67 per cent. satisfied the examiners. Considering that this system of examinations was set on foot in order to apply a test to the educational system throughout the country, in order to ascertain how far the schools are doing their work properly, and how far those educated in them are receiving the benefits which the schools are intended to confer, it must be satisfactory to see that within the period of six years so large a progress had been made. It was not only because the examinations which this Board was conducting presented results of that kind that he rejoiced at the work done, but because he was glad to find that there was in this important metropolis of the middle classes, a body of persons who were paying attention to education, and whose co-operation would be most valuable at the present time, when the education of the middle classes is attracting so much attention in the country. At one time people used to look upon and speak of education as a simple amount of instruction or as the imparting a certain amount of knowledge. By degrees it began to dawn upon people that there might be more in it than simple instruction, that education meant not merely the imparting of knowledge, but the formation of character, the formation of habits of mind, which would enable people to acquire knowledge for themselves. And then, strange to say, we had rather exaggerated that truth, inasmuch as in many places there was a disposition not to overrate instruction but actually to underrate it, and to make so much of what we call the training and discipline of education as to treat instruction—definite instruction—in matters which might be of use to persons in the pursuit of life, as if it were absolutely non-essential, and should constitute no part of education at all. The great difficulty to be met with was this, that we must endeavour to combine, as far as possible, the educational process with the instructional process. We must be careful, in laying down a system of education, not to make it either materialistic or too simply utilitarian, so as to drive away the student it was desired to retain. If that was the view to be taken they would see that it was of the greatest importance we should endeavour, in laying down any system of education applicable to the middle classes, to provide such a scheme of education as will at once give the most that can be given in the way of general training and general development of character, and which at the same time will give that which they most need for the particular pursuits to which they are to devote their lives. The Chairman went on to argue that the principle of "supply and demand" when applied to education was not sufficient, as there was in fact not enough enlightenment to produce a demand, and that these examinations, as demonstrating the value of education, exercised a most useful influence. Examinations, judiciously conducted, furnished the most perfect test of the character of the work of any student. How was the machinery for examinations to be supplied? We ought not in this matter to be wholly resting upon the Government. It was a matter which the people of England must mainly do for themselves. At the same time they must not be too proud to accept asistance in the way of advice, organisation, or encouragement on the part of the Government, if such should be found desirable. The assistance from the Universities in this matter was most valuable, as well as that afforded by the Society of Arts, and other bodies which undertake the management of examinations of this sort. After touching upon the subjects of grammar-schools, and urging the importance of a wiser distribution of their endowments, Sir Stafford Northcote concluded by a brief and encouraging address to the successful students, and then distributed the prizes. The Rev. Canon Atlay moved the first resolution, to the effect that the Local Examinations of the Universities of Oxford, Cambridge, and Durham offer an effectual mode of testing the soundness of education in middle-class schools, and, by the excellent arrangements and prizes of the West Riding Educational Board, had been made of great advantage to the schools of Yorkshire and the north-east of England. This was seconded by Mr. Beecroft, M.P., and carried. Mr. Henry Cole, C.B., moved the second resolution, as follows:—"That the system of Examinations in special subjects by the Society of Arts, with the award of certificates and prizes to successful candidates, having proved a most valuable stimulus to adult education, and the Elementary Examinations in connection with the Society of Arts being a most important aid to the members of Mechanics' and similar Institutes in preparing them for examinations of a more advanced character, they are deserving of public support, in order to render their advantages more generally available." Mr. Pakington, in seconding the resolution, said, it was the object of the Local Educational Board, established in connection with the Society of Arts, to give publicity to their proceedings and facilities to the candidates who wished to attend these Examinations. The Society had found that a great and growing want had been felt throughout the country of a test of the education obtained at the classes in connection with Mechanics' Institutions, and had thrown out those inducements to the members. There had been lately instituted a Committee of Unions, meeting under the auspices of the Society of Arts, to promote uniformity in the standard of Elementary Examination in each provincial district. He had no doubt that if all the Local Educational Boards were as energetic, and carried out their work as efficiently as that of Leeds, the cause would prosper. The resolution was unanimously agreed to. Mr. Alderman Kitson moved a resolution to the effect that the Board were entitled to the support of the public of Yorkshire and of the north-east of England. This was seconded by the Rev. Mr. Longsdon. On the motion of the Rev. Canon Atlay, seconded by Mr. Beecroft, M.P., a cordial vote of thanks was given to Sir Stafford Northcote for presiding.

Fine Arts.

Encouragement of Line Engraving in France.—The recent competition for the grand prize of Rome is likely to prove important to the engraver's art; the specimens submitted to the jury were so inferior that no prize was awarded, and the fact is but too evident that, in consequence of the comparative cheapness of photography, or from that and other causes combined, the burin has become almost a neglected instrument. This is certainly greatly to be lamented, and the artistic world of France has taken the alarm. There is in the Louvre a department of Chalcographie, for the express purpose of encouraging engraving, but it has not sufficient funds for the purpose, and perhaps the very nature of a governmental establishment is against it. One complaint made against it is, that sufficient encouragement is not afforded to native art. In these circumstances the city authorities of Paris have taken up the matter, and are about to try and raise up the engraver by giving him some important commissions. The first step taken is to be the engraving of the principal works which ornament the churches and municipal buildings, and some of those in the fine church of Saint Eustache are selected to commence with. Three engravers have been commissioned to reproduce the paintings by M. Signol in one of the chapels of that edifice, consisting of three subjects and two single figures, at an estimated expense of a thousand pounds. The plates will remain the property of the city of Paris, and it is probable that an arrangement will be made with the engraving department of the Louvre for the publication of the prints, as was done by the city some time since in the case of an engraving of a portrait of the Emperor after Horace Vernet. The only kind of engraving, except that on wood, which is much practised in France at the present moment, is etching, and some of the works of this class are admirable. There is a society of *aqua-fortistes*, now three years old, which has published some remarkable etchings. The art is taught in the schools of art, and a course is about to be commenced in the female school in the Rue Dupuytren, of which Rosa Bonheur is, or was, the directress. There are also some important works of this kind being executed for the government, which will be noticed shortly. In connection with this subject it may be mentioned, that the Superintendent of Fine Arts has authorised the reproduction, by means of photography, of the sculpture, both ancient and modern, in the Museum of the Louvre.

Public Works of Art in Paris.—The present is harvest time for French painters and sculptors. In addition to all the works which have been recorded as in progress, a number of commissions have been given for the decoration of the fine church of Saint-Sulpice, and two small chapels have just been completed. M. Bonnegrace has also recently painted a fine picture for the church of Saint-Louis, in the island of that name. M. Saley, member of the Institut, is now at work on a statue, to be cast in bronze, of François Premier, for the vestibule of the central court of the Hôtel de Ville; and M. Crank on a bust of the Empress, for the throne room of the same magnificent City Palace. In addition to these commissions the Prefect of the Seine has purchased four busts, attributed to Canova, representing the four brothers of Napoleon, for the four angles of the Salon de l'Empereur, in the same building, decorated twelve years since by M. Ingres. These busts were formerly at Malmaison.

Amiens Museum.—This is a new establishment on a grand scale, and it and other provincial galleries are being raised into importance by the Government of Louis Napoleon. The Amiens Museum has been declared to be Musée-annexe of the Louvre, and has, in consequence, received some pictures for which there was no proper space in the Luxembourg gallery, and some others out of the reserved stores of the Louvre. It is said that it is also in contemplation to send good copies of famous pictures to the various provincial galleries. Such distributions are most praiseworthy, and with such a wide field open it is to be hoped that in a short time no picture or statue worth seeing will be hidden in the store-rooms of the Louvre or elsewhere.

Exhibition of Cartoons at Brussels.—The literary and artistic institution of Brussels has just opened an exhibition of cartoons, under government patronage. The painters Kaulback, and the Eckels, of Munich; Henri von Hess and Julius Schnorr, J. Henbach and C. Muller, of Dusseldorf; and the French artists Hippolyte Flandrin, Victor Orsel, and Chenavard, are prominent amongst the exhibitors—one alas! posthumously. The cartoons contributed by the last-named artist are those intended for the decoration of the Pantheon by the Provisional Government of 1848, and which were to be seen at the Universal Exhibition of 1855. The committee has had the good taste to borrow some choice paintings in order to enliven the appearance of the Exhibition, which would otherwise have been of too monotonous a character.

The Munich Venuses.—A report is current that the King of Bavaria has caused the three statues and the famous torso of Venus to be withdrawn from the Hyptotheque, and shut up in a private room in the Pinacotheque. This, if true, would be bad enough, but if, as asserted, the finest of the three statues was thrown down in the act of removal and "broken into a thousand pieces," a strange caprice has resulted in a real misfortune. It is to be hoped that the whole report is unfounded.

Sale of the Late King of Denmark's Gallery.—The collection of Frederick VII. has been announced for sale; it includes six hundred works, amongst which are pictures by Rembrandt, Rubens, Van Dyke, Robera, Salvator Rosa, Correggio, and other great masters, but the greater portion are the work of Danish artists. The sale was to take place at the Château of Christiansborg, in Copenhagen.

The Colossal Statue found in Rome.—This fortunate discovery has given rise to much conjecture, and to accounts so contradictory as to create an impression that either the whole story is a myth, or that somebody is busy disseminating information he does not possess. It is said, on the one hand, that the work is gilt bronze, that it has been laid bare to the knees, but that the excavations had been stopped by an irruption of water. At first, it is said, the statue was taken to be that of Pompey, because it was found in the ancient circus which bore his name, but no resemblance could be found to existing likenesses; then it was conjectured to represent Diocletian, why, is not stated; lastly, the *Correspondance Litteraire* calls it without hesitation "the celebrated Satyr attributed to Praxiteles," of which copies exist in several European museums, the Louvre amongst others; we say copies, for all agree that the original was lost. The broken statue just discovered is certainly an original; the artists and antiquarians who have seen it have no doubt about that. It is moreover of remarkable beauty, and has even been pronounced by a perfectly disinterested person to be one of the finest bits of sculpture in Rome. This statue, representing the Satyr of Praxiteles then, being an original, it may be safe to conclude that it is the very marble which was wrought by the chisel of the Athenian sculptor; in fact, if the original existed at Rome, where could it have been better placed than in a room of the apartments of the Emperors, that is to say, precisely where it has been discovered. The hypotheses and contradictions here are plentiful enough, but the proofs of this bronze statue being the original marble worked by Praxiteles are unfortunately not quite conclusive. We must curb our impatience a little, and hope that the exquisite Venus, so-called, of Milo, may have a worthy companion raised from the Roman dirt.

Photographic Printing.—A new invention is announced which, if it accomplishes what it is stated to effect, will give a great impulse to the Art. The nitrate of silver and hyposulphite of soda, the two agents now employed in the production of positive prints, are entirely got rid of, as well as the use of albumen for giving a surface to the paper. Photographs printed on the present system, with these substances, are, except under special circumstances of very careful preparation and careful custody, liable to fade and change, and no absolute reliance can be placed upon them for lasting. Hence it has been a great desideratum in the photographic world to attain the object by using other substances than those named above, which are known to chemists to have in them, as it were, the seeds of decay. Carbon has been tried in various ways, and great progress has been made of late in this direction, and very beautiful results, indeed all that could be desired, have been accomplished, but the process is not easy of manipulation, and requires great care, time, and skill to effect, involving the risk of many failures, so that, for general use commercially, it is not likely at present to be adopted. The actual details of the new process are not yet made public, but it consists in coating a sheet of paper with collodion, in which are dissolved certain salts of uranium. When dry, it is exposed to the light under a negative, in the same manner and for about the same length of time as paper prepared on the present system. It is then washed in a liquid, said to be an acid, which dissolves all the uranium salts, after which it is washed in plain water for a few minutes, and the picture is complete, the tone being of a bistre colour; this, however, can be changed into the usual deep purple tone by the ordinary toning process. The invention is that of M. Wothly, of Aix-la-Chapelle, and its permanency is alleged to have been tested by a vast number of laboratory experiments. It must, however, be added, that specimens done by this process twelve months ago in this country, by M. Wothly himself or his agent, do not come up to the perfection of silver prints in beauty and delicacy, and appear to have decidedly changed. It is moreover stated that a firm in Paris, which commenced working the process there some time since, has now abandoned it entirely.

Manufactures.

Dispute in the Carpet Trade.—In May, 1863, an agitation commenced in the above trade for an advance of wages equal to 10 per cent. upon the weaving of Scotch carpeting. In the following July the Carpet Manufacturers' Association held their annual meeting at Halifax, when a deputation from the workmen presented a momorial setting forth their requests, but, after discussing the question at great length, the meeting gave an adverse decision. The deputation went back to their respective districts and apprised the workmen of the result. Special meetings of the trade were held, and resolutions passed urging on their central committee the necessity of using their influence with Mr. William Henderson, of Durham, president of the Masters' Association, with the view of obtaining a special meeting of that body to reconsider their decision. In compliance with a memorial to this effect, the president consented to convene a special meeting of the masters, in December, at Leeds, and when it took place, the same deputation of workmen was once more in attendance. The result was, that the masters admitted the workmen's claims to be reasonable, and expressed their own readiness to comply on condition that the manufacturers of like goods in Scotland would give a corresponding advance to their workmen within six months from February 1. The workmen in Scotland now began agitating for this advance, and a meeting of the Scottish manufacturers was held on the subject in February, at Glasgow, the issue being, as at the first similar meeting in England, a refusal to accede to the wishes of their workmen. The agitation in Scotland still continued, and after ascertaining the opinions of the workmen of Scotland upon the question at issue, a united deputation of English and Scotch workmen waited upon each of the Scotch masters, and personally solicited their influence with Mr. Hugh Wilson, of Kilmarnock, chairman of the Scottish Masters' Association, with a view of obtaining a special meeting of that body to reconsider the decision come to at Glasgow. A second meeting took place in July, in the same city, which was largely attended, and the English president, Mr. Henderson, was present by invitation. A deputation of Scotch and English workmen also attended. A long discussion took place on the question at issue, ending in a resolution which would virtually have given an advantage of 10 per cent. in the weaving of certain fabrics to the Scotch manufacturers over their English brethren. This was at the time protested against, and a meeting of the English masters was held a few days later at Leeds, when a deputation of their workmen again attended. At this meeting the English masters decided to make these two propositions to the masters of Scotland:—First, a scale of wages giving to the workmen all they asked for and establishing a difference of five per cent. in favour of the Scotch over the English masters; second, a somewhat lower scale of wages establishing a similar difference of five per cent. The Scotch masters at once accepted the first proposition, and thus a complicated question was satisfactorily arranged. The attendant difficulties may be estimated when it is considered that the money interests of the English and Scotch masters are opposed to each other, and that the interests of the workmen of each country were opposed to those of their masters. All matters being now fully arranged to the entire satisfaction of all parties, the new scale of wages came into operation on the 1st of October. Such is the brief history of an agitation worked throughout on purely moral principles. While many other trades are suffering under the lash of their own follies the carpet weavers are reaping the reward of prudence and forethought. Would it not be wise for other trades to follow the example this case presents, and let employers and workmen meet annually to settle their differences by reason and argument, instead of resorting to coercion and intimidation? Many years have now elapsed since the harmonious feeling betwixt the masters and workmen was disturbed, and now their relations are strengthened by mutual confidence and respect.

Industrial Exhibition in the Coachmaking Trade.—A meeting of the employers and workmen in the above trade was recently held, at the Carriage Bazaar, Baker-street, to consider the propriety of establishing an Annual Industrial Exhibition. The meeting was presided over by G. N. Hooper, Esq., who stated the great pleasure he felt in meeting so many skilled artisans willing to support the proposal, and he was quite sure that an exhibition, open to all branches connected with carriage building, would prove very attractive, not only to members of the trade, but the general public, who were at present quite ignorant of the method upon which carriages were constructed. Resolutions approving the object of the meeting, and also soliciting the co-operation of the Society of Arts and the Worshipful Company of Coach and Coach Harness-makers, were moved by J. F. Woodall, Esq., G. Thrupp, Esq., and J. Robinson, Esq., and carried unanimously, after which the meeting was adjourned until Thursday, the 6th of October, when a committee will be formed.

The Deterioration or Crystallisation of Wrought Iron.—An article in the *Engineer* reproduces the explanation given last May by Mr. Paget, C.E., before the Society, of the deterioration of wrought iron. It will be remembered that it was pointed out, and evidenced by numerous experiments, that wrought iron is rendered more or less brittle by strains in excess of the limits of elasticity. 2. That a crystalline fracture is produced by any sudden rupture. 3. That a state of brittleness—whether due to defective manufacture or to excessive strains—would render a bar peculiarly liable to rupture under impulsive forces. 4. That rupture under such circumstances must be sudden, and consequently crystalline in appearance.

Beet Root Spirit.—The Commissioners of Inland Revenue in their last report say:—"After patiently watching these experimental distilleries for seven years we are relieved from further anxiety on the subject by the final relinquishment of the manufacture by the last of those gentlemen who had embarked in the undertaking. We understand that in all these cases the experiment has entirely failed as a remunerative speculation."

Malt.—It appears by the report of the Inland Revenue Commissioners that the number of bushels charged with duty in the year ended 31st March, 1863, was 41,064,830, and in that ended 31st March, 1864, 47,935,949, showing an increase of 6,871,119. The quantity made in 1864 exceeds by 2,379,763 bushels the largest ever before charged in a like period. This is attributable to the unusually fine quality of the barley grown in England in 1863, and to the small stock of malt on hand at the end of the previous year. The stocks at the present time are very considerable, a circumstance which must be taken into account in estimating the duty for the current year.

Commerce.

Sea Fisheries Commission.—It appears from evidence given before this commission that considerable changes have of late years taken place in the extent and profitable character of the fisheries on the coast between the mouth of the Mersey and the Isle of Man on the east and west, and Cumberland and Carnarvon Bay on the north and south. During the last 20 years the number of boats employed has not materially increased or decreased, but the boats have been of larger build during the last few years. Within four or five years past, a practice very injurious to the fisheries generally has grown into formidable proportions, and threatens to destroy the supply of soles, haddock, plaice, turbot, and other fish, which has hitherto been equal to the demand of the Liverpool market, and a large extent of country besides. The shrimping boats, which fish on the mud and sand banks in the Mersey, upon which vast numbers of young fish feed, carry, besides their shrimp nets, trawling nets, with very small meshes, and during the months of August, September, and October, they catch enormous quantities of the young fish and bring them to market. To this the dealers attribute the great falling off which has been observed during the last four or five years in the spring fisheries. The supply of soles has diminished very greatly, haddock has almost disappeared, and the general decrease is described as very serious. The witnesses examined by the commission did not consider the shrimping injurious, but they urged the necessity of prohibiting the use of small mesh nets on the feeding banks; and some of them recommended a restrictive enactment forbidding the dropping of a net within ten miles of the mouth of the river. It was even suggested that if such regulations were imposed the supply would be doubled next year.

Colonies.

Cultivation of Sugar in Queensland.—In the selection of land for a sugar plantation, care should be taken that the soil is adapted for the purpose, as chiefly on this will depend the quantity of saccharine matter. The yield on the most favourable soils is double that of calcareous marl or sandy soils. The plantation should be on an incline if possible, or on a high level, so that it will not be subject to swamping, and will not require much drainage. Black clay is the most suitable, as it will retain the moisture longer than any other. Alluvial soil, from 12 to 14 inches on clay, is also very good. Rich alluvial soil is good, but canes grown in this ground will not have hold sufficient in the soil to withstand strong winds. As they grow very soft in this soil, too, strong winds are likely to do them much damage. The varieties of sugar canes being indigenous to China, it was from thence they were first imported into the West Indies and other colonies. They include the green, the ribbon, the Mexican, and Otaheitan. The ribbon stands next to the green in growth, but the others are very backward. When the canes attain their full height, and are ripe, they should be cut down at once and manufactured, and not be allowed to sprout from the eyes, as the juice then loses its sweetness and takes double the time in boiling to the consistency of sugar. Also before the canes are ripe there is the same effect in boiling. In cutting the plants, as in planting, each labourer takes his row, cutlass in hand, the cutter's wife, or a lad, behind each cutter tying up the canes with the refuse tops; they are brought to the margin of the field, tied up in small bundles, and then packed in the cart and taken to the mill for grinding.

Adelaide.—South Australian Society of Arts.—The 7th annual report says that there is much reason for congratulation and great encouragement in the fact of the Institution having attained the 7th year of its existence. In the first year of its operation, the Society numbered 65 members, the present year's list contains 221 names. The annual Exhibition, which in 1857 yielded £64 11s., with an attendance of about 1,300, yielded last year only £55 6s., with an attendance of nearly 3,000, the larger portion of whom were admitted free. Thus it appears that the annual Exhibitions have been popularised by free admission on certain days, and it is expected that this liberality on the part of the Society will be productive of good effects in subsequent years. The art objects collected for exhibition have met with a more extensive appreciation. In the number of works of art sent in for competition the increase has been immense. In 1857 not more than four pictures were sent in, while in 1863 not less than 46 were admitted. In fact, there has been a rapid advance in the number, and a not less marked progress in the style of colonial works of art, and the Committee have observed with pleasure that year by year the colonial pictures exhibited are becoming more numerous, more interesting, and of higher artistic value.

New South Wales.—The customs revenue collected, at the port of Sydney during the month of May amounted to £47,657 15s. 2d. For the corresponding month of the year 1863, the receipts reached £98,537 0s. 3d. The decrease on the month is, therefore, £50,879 5s. 1d., or about 51½ per cent. The reason for this great falling-off in the customs revenue is owing to the fact that at that time last year considerable excitement was caused by the Conference at Melbourne, and this induced speculators to take out almost all the wines and spirits then in bond, on which it was supposed the duties would be increased. During the first five months of the present year the customs revenue has amounted to £231,756 7s. 1d. against £325,473 7s. 6d. for the same period of the year 1863. The decrease on the five months is, therefore, £93,717 19s. 7d., or 28½ per cent. But during the present year £16,000 was received for duties under the new tariff, which did not pass, and this amount has since been refunded, consequently the decrease on the present year will amount in round numbers to £110,000, or 34 per cent. This falling-off in the customs revenue, however, may not average more than 17 per cent. for the year, because during the last six months of the year 1863 there was a considerable decline, and the revenue for the month fell as low as £29,000. The average monthly receipts for 1863 amount to £52,000 against £43,000 for the present year. The decrease per month is, therefore equal to £9,000, or 17 per cent. The following are the, amounts received monthly during the first five months of the years 1863 and 1864:—

	1863.		1864.
January	£62,945 13 7	...	£49,509 6 8
February	48,075 0 9	...	49,259 19 2
March	54,544 4 10	...	41,147 12 0
April	61,371 8 1	...	44,181 14 11
May	98,537 0 3	...	47,657 15 2
	£325,473 7 6		£231,756 7 11

Minerals of New South Wales.—Each colony except New South Wales has already become distinguished for some special productions:—Victoria for its agricultural and auriferous wealth; Adelaide for its copper and wheat; Western Australia for its timber and fisheries; Queensland for its pastoral capabilities. New South Wales, despite the aid she has received from her magnificent harbour and from other adventitious circumstances, has now ceased to hold her own as a wool-growing country, has failed as an agricultural country, and has been fairly outstripped by Melbourne in matters commercial. Nothing has been attempted in New South Wales as compared with what has been accomplished elsewhere to unfold and render productive the natural wealth of the country, viz., its mineral wealth. No colony in the Australian group possesses coal in the quantity, or of the quality, or in the favourable sites in which this valuable mineral is to be found in New South Wales, and this even in close vicinity to the capital. Many valuable clays and ores abound throughout the colony, particularly iron and coal. These minerals at this moment exercise a paramount influence over our destinies in many parts of the world, and they must inevitably continue to do so, at least during this iron age. Iron ore is to be found in many parts of this colony side by side with coal beds. Notably, at Brisbane Water, there are rich lodes of iron ore almost overlying bituminous coal beds, and in close vicinity to thick strata of fire clay. Lime shell is procurable at the same spot at several wharves, alongside of which vessels much above 100 tons burden may be moored in perfect safety. Such a fortuitous combination of all the elements requisite for the production of iron can hardly be exceeded. But at Brisbane Water its value is peculiarly enhanced by its existence within twenty-five miles of Sydney Harbour. Strange to say, this valuable product was ignored, until recently undeniable proof of its reality was afforded by the importation into Sydney of specimens of each mineral direct from Brisbane Water. These have excited much public attention, and it is to be hoped they will be turned to profit. It is in contemplation to work some of the gold mines of New South Wales by Victorian companies. In the latter colony, gold mines are worked with profit, giving only a return of ten pennyweights to to the ton. In the former colony, a yield of double that amount is not considered remunerative, and mines giving such a yield remain now deserted.

Emigration to Melbourne.—A return published by Government shows that in the eleven months ending 25th May last, 1,579½ statute adults (representing 1,844 persons of all ages) were sent from England and Wales under the immigration regulations; from Scotland, 573 adults (663 persons); and from Ireland 3,427 statute adults (or 3,637 souls). There were thus 5,579½ statute adults or 6,143 persons of all ages sent from the three kingdoms during the past eleven months under the regulations.

Flour from South Australia.—An Adelaide paper states that there is now every prospect of that great desideratum being attained—the export of South Australian flour in barrels, and not in bags. This change has been urged for years past, but it was feared that the extra cost of barrels would preclude the use of the former. An enterprising merchant of that city has sent orders for the shipment of a large quantity of barrels, and also forwarded instructions to his agent to open negotiations with the best American houses with a view to a regular supply of American flour barrels for the export trade of South Australia.

Birds for Australia.—A New Zealand paper states that the ship *Violet* has arrived from England. A very large number of British birds were shipped on board of her, but most of them died on the voyage. Out of six dozen sparrows only two survived; all the larks died. Eight blackbirds, twelve starlings, eight linnets, eight yellow-hammers, and some chaffinches and greenfinches were landed.

Publications Issued.

Pocket-Book of Practical Rules for the Proportions of Modern Engines and Boilers for Land and Marine Purposes. By N. P. Burgh. (*Spon.*) Oblong 32mo., pp. 190.

Practical Illustrations of Modern Land and Marine Engines. By N. P. Burgh. (*Spon.*) This book shows in detail the improvements in high and low pressure, ordinary and surface condensation; together with Cornish land and superheating marine boilers. Imperial folio.

The Engineers' Guide to the Royal and Mercantile Navies. By a Practical Engineer. Third edition, carefully examined and revised by Mr. D. F. M'Carthy. (*Virtue.*) This work contains the new Act of Parliament, with hints on the Question of the Board of Trade Requirements; also a full account of the indicator, &c., illustrated with diagrams, &c., and oral questions and answers, assisting the engineer to pass the *viva voce* Examination. 12mo. cl. sd., pp. 144.

The Anthropological Society has just issued another volume, "The Plurality of the Human Race," by George Ponchet; translated and edited by Hugh J. C. Beavan. In this, while bearing testimony to the value of M. Ponchet's writings, the translator states that his own opinions differ considerably from the author's, and especially upon the question of spontaneous generation.

Notes.

Streets named after Artists.—In the recent changes made in the street nomenclature in Paris, the names of literary, scientific, and artistic celebrities have been largely introduced. In the list are the names of Froissard, Béranger, Laplace, Victor Cousin, Fresnel, Dupin, Bernard-Palissy, Casimir-Delavigne, Vernet, Harvey, Titien, Rubens, Niepce, d'Alembert, Lalande, Marmontel, De Musset, Talma, Claude Lorrain, Decamps, Lancret, Beethoven, Donizetti, Scheffer, Petrarch, Poussin, Bellini, Raphael, Ingres, Le Sueur, Delaroche, Galvani, David, and Davy.

Discovery of an Immense Mass of Flint Implements.—Last year, what is supposed to have been the remains of a place of manufacture in the time of the age of stone, was discovered at Pressigny, in the French department of Indre-et-Loire, by the Abbé Chevalier. A more important discovery has recently been made in the same neighbourhood by Dr. Léveillé, of Grand-Pressigny, and it has been communicated to M. Elie de Beaumont and the French Academy by the Abbé. It appears that the quantity of half-worked flints and implements found in this supposed ancient manufactory is immense, and they lie sometimes almost absolutely on the surface of the ground. The largest specimens yet found are about eight inches long, and most of these are of an irregular prismatic shape, tapering at both ends; the ploughmen turn them up by thousands, and pile them up at the edges of the fields. The peasants, struck with their form, have given them the name of pounds of butter. The finished implements consist principally of hatchets, hammer heads, knife-blades six to eight inches long, scrapers, and lance heads. The supposed manufactory extends over several acres. But the most interesting discovery of all is that of a large block of hard, brown, free stone, which is scored on the surface with deep angular grooves, which appear to have been for the purpose of polishing the flint implements; this stone measures about ten inches by six. Most of the flint is white, but many of the pieces found are of a reddish colour. The immense quantities to be found may be guessed from the fact, stated by the Abbé Chevalier, that two persons from Poitevins collected many hundred weight in a few hours without digging or otherwise disturbing the ground. The site is known as the Claisière, and is situated nearly at the highest part of the plateau which divides the valley of La Claise from that of La Creuse. It is situated at an altitude of rather more than three hundred feet above the sea, and nearly that height above the rivers in the neighbouring valleys. The soil is a mixture of clay and silex, the latter being both in grains and nodules; it is not more than five or six feet deep, and reclines on a bed of chalky loam. The formation is said to resemble that of the free stone range of Fontainebleau, and to be beyond all question antediluvian.

Provincial Rewards for Industry in France.—The General Council of the Department of the Somme has for some time voted a sum of money for the purpose of awarding medals and recompenses to the most deserving amongst the industrial classes of the neighbourhood every three years. The distribution took place recently in one of the galleries of the Musée Napoleon, in the chief town of the department, Amiens. The whole of the Council was present, and the proceedings were marked by great enthusiasm. The prizes varied from 25 to 200 francs, and were accompanied by medals. The number of recipients, male and female, amounted to fifty, and the prizes were bestowed for inventions, improvements, and services rendered to industry, for fidelity, and for long service. The most popular recipient of a first class prize, with silver medal, was a workman, named Pierre Charles Buiret, a native of the lock-making town of Vimere; he is 43 years of age, and his inventions and improvements are said to amount to three or four times that number. Amongst other achievements, he is said to have reduced the cost of the manufacture of furniture locks to the extent of 40 per cent.; he is the inventor of a machine for bending the plates of the locks to sharp angles with great precision and rapidity; the machine works by steam, and is in use in the works of M. Valery Fournier, at Dargines. Amongst the prizes for long service, one was given to a widow 85 years of age, who had served for 74 years in the same employment. The President of the Chamber of Commerce of Abbeville took the opportunity of citing the example of a gentleman present, M. Petin, who, having quitted Amiens an artizan with twenty pounds in his pocket, became maire of a neighbouring place, and proprietor of a factory which employs more than six thousand hands.

King's College (London) Evening Classes.—These classes will commence on Monday next. Professor Levi's course this year will commence with a lecture on the present state and prospects of the rate of discount, and include lectures on commercial crises, on the principal trades of the empire, on means of communication, on coinage and banking, and on commercial law, including shipping, partnership, bills of exchange, and other branches.

Archæological Discoveries in France.—During excavations lately made on the borders of the wood of Rochecardon, in the outskirts of Lyons, a Roman camp has been laid open. The remains of iron arms were found in great quantities at various depths, as well as fragments of brass armour, fibulas of curious form, rings, buckles, divers ornaments, pieces of metallic mirrors, and other objects. At the depth of about twenty feet several arms were found entire; swords, axes, lance heads, arrow points, portions of casques and shields, all in iron, and in fair preservation. There were found also medals of Domitian, Antoninus, Marcus-Aurelius, and one in silver of the Emperor Albinus. The position of this newly-discovered camp, situated on the summit of a hill on the banks of the Soane, near another camp long known to antiquarians, near Ecully, gives rise to the belief that here occurred one of the sanguinary episodes of the great battle between Albinus and Septimus-Severus, which was concluded, according to the opinion of the *savans*, on the plain of Sathony, on the opposite bank of the river. The arms thus discovered have been purchased by M. Vaganay, a well-known antiquary, residing in the Rue Imperiale at Lyons. Another important discovery has been made by the dredging of the River Mayenne, at Saint-Leonards ford, near Brives, namely, the foundations of a Roman bridge, which, it is supposed, was a wooden structure and only for foot passengers and equestrians using the ford, in the middle of which stands an ancient mile stone bearing the remains of an ancient inscription. It is supposed that the road from Neodunum (Jublans) to Ingena (Avranches), passed over the river at this spot. The workmen have discovered a large quantity of Roman copper money, principally of the time of Augustus, Tiberius, Germanicus, Claudius, Nero, Vespasian, Titus, Domitian, Nerva, Trajan, Adrian, and Antoninus. Most of the coin is new, and without oxidation. With these were many small ornaments in bronze, including two small hatchets and a number of brooches or mantle pins. The authorities of the place and the government engineer on the spot have organised the search, which creates an intense interest, and which will furnish valuable matter for the museum just established at Mayenne. The presence of the large quantity of coins is accounted for in the following manner:—The Romans were in the habit, when crossing a stream, to throw in small pieces of money and ornaments, as propitiatory offerings to the divinity to whom the river was dedicated. When the river Vilaine was deepened at Rennes, and that of Morgan at Villefranche, in the years 1841 and 1842, an immense quantity of coins and other small objects was found. Amongst the rest a portion of a terra-cotta statuette was found, conjectured to be an image of Venus Anadyomene, to whom it is imagined the river was dedicated. M. Trouillerd, of the Mayenne bar, is engaged in drawing up a memoir on the subject for the Emperor. Ernée and Jublans are marked in the old itineraries as stations on the roads from Valognes to Tours, and from Lyons towards Coriallum, to the east of Cherbourg, and as the name of the town of Brives signifies in the Celtic language a fort, it seems probable that such a building existed near the spot referred to. A third discovery has taken place at the Chateau-Gaillard, near the Andelys,[*] where the entrance of a tower has been laid bare, but funds are wanting for pushing the examination. Some small objects have, however, been brought to light—a small crucifix, a key, and a coin. The last is of the coinage of Henry VI., proclaimed King of England and France in 1482. On one side are the arms of the two kingdoms, with the words, "Henricus—Francorum et Angliæ rex," and on the other side a cross, a fleur-de-lis, and a leopard, with the words "Henricus—Sit nomen, N.D.I., Benedictum." Not long since a coin of John, King of England, was found near the spot.

Postage to Holland.—Letters may now be sent, *viâ* Belgium, for 3d. the ½ oz., if prepaid, and if sent unpaid, or insufficiently stamped, they will, on delivery in Holland, be charged 3d. additional. Hitherto the charge has been 6d. the ½ oz. through France. Newspapers are still sent that way, the charge for 4 oz. being 2d.

Foreign Postal Arrangements.—The French Government has for a long time offered to increase the initial weight of letters between France and England from 7½ grammes (or ¼oz.) to 10 grammes, but the British authorities decline the proposal, on the ground that there exists no English weight corresponding with the 10 grammes which is about four-twelfths of an ounce. The *Times'* correspondent is of opinion that a special weight might be created, but that is a suggestion that seems scarcely feasible. The matter is very important, and the present weight ridiculously inadequate to the wants of the two countries; and in case of the slightest overweight the receiver of the letter is mulcted to the extent of 1s. (or 1fr. 20c.), the amount of the double postage less the stamp employed. The initial weight for letters within the limits of Paris is 15 grammes, that is to say, according to the arrangement between the French and English post-offices the equivalent of over ½oz. The French, therefore, not only have our initial weight while we have not theirs, but it is actually the Parisian unit—10 grammes being that of the provinces. It certainly, therefore, seems more reasonable to ask the French office to adopt the ½oz. than to expect the authorities and people of England to adopt the 10 gramme weight. The post-offices of both countries have set an example to all other departments in the way of reform, and it would be a great boon to both nations to get rid of the quarter ounce, which has already disappeared between France, Belgium, Italy, and, we believe, some other countries. Perhaps our Government will not think it *infra dig.* to make another effort, and thus obtain another boon for the English merchant and manufacturer.

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[*] In the department of the Eure.

MONEY ORDERS BETWEEN FRANCE AND ITALY.—The arrangement already noticed in the *Journal* for the payment of small sums through the French and Italian posts, came into effect on the first of the present month. The amount of each order is limited to a maximum of 200 francs, and the tax is 20 centimes per 10 francs, that is to say, two pence on eight shillings nearly. Another important condition is, that the orders are transferable by indorsement. The extension of this excellent arrangement to England can only be a matter of a little time, the difficulty of remitting sums too small for a banker's check being most seriously felt by the poorer portion of the natives of one country residing in the other—and the number of English of small means in Paris and other parts of France is very considerable.

SUBMARINE ELECTRIC LIGHT.—Important experiments have been made with the electric submarine light, or "Lantern of Neptune," as, in one case, it has been christened. At Cronstadt, with an apparatus arranged by M. Von der Weyde, and under the superintendence of General Krabbe, the chief of the Russian Ministry of Marine, and General Todtleben, and other officers, the lantern has been used in the operations for opening the channel to allow the passage of the new monitors, and it is reported that at a depth of sixteen feet a diver could easily distinguish objects at a radius of about thirteen feet from the lantern. The other experiments were made at Lorient with the apparatus of M. E. Bazin, in the presence of a commission specially appointed for the purpose by the admiral and maritime perfect of the department. In the first place the power of the light was tried on the great basin, which is more than three hundred feet long, and in which were the *Européen* and another vessel. The report says:—"It may be said that daylight reigned over the whole of the basin, even in the remotest corners. Engineers went over the vessels, and could see all the details perfectly." A mast was erected for trying the effect of the light with regard to signals; the ship *Duchayla* was anchored at a distance of 700 mètres, nearly 2,280 feet from the mast, and another vessel, the *Panama*, at 500 mètres distance. Signals were then made to and fro, the light being thrown alternately on the mast and on the ships with perfect ease. A diver was then sent down into seventeen feet water, and amongst other evidences of the power of the light was the reading of the decimal divisions on a metrical scale specially prepared for the purpose, and thrown down to the man who was at six mètres, more than nineteen feet and a half from the lantern. It is said that the report of the Commission will declare the light applicable for all submarine works, as it has already been found to be in the case of extensive building and other operations. The fish were attracted in great numbers and swarmed around the lantern.

Patents.

From Commissioners of Patents Journal, September 30th.

GRANTS OF PROVISIONAL PROTECTION.

Advertising, means of and apparatus for—2249—L. J. Paine.
Aniline, colouring matters obtained from—2244—J. H. Johnson.
Barometers, scales of aneroid and mercurial—2267—J. B. Huntington.
Blast furnaces—2269—C. Attwood.
Bookslides—2261—J. C. Hunter.
Boots and shoes, cleaning the lower parts of—2287—J. M. Napier.
Bricks, manufacture of—2128—C. Russell.
Carriage axles—2283—R. Richards.
Chlorine, manufacture of—2313—I. Baggs and W. Simpson.
Chromium, manufacture of salts of—2175—J. K. Leather.
Collieries, &c., elevators for raising water and minerals from—2007—A. Alison and J. Shaw.
Concrete, mixing the materials for making—2214—T. D. Ridley.
Cotton, gins for cleaning seed—2303—C. H. Robinson, J. Fryer, and A. Dyson.
Cotton gins, rollers for—2019—W. Richardson.
Distances, instruments for measuring and registering—2247—J. E. Morris.
Dress, fastenings for articles of—1281—J. Edwards.
Dyeing and printing, colouring matters for—2181—W. H. Perkin.
Eggs, removal of the ends of—2220—A. Watt.
Engines, &c., wheels and axleboxes for—1731—St. J. V. Day.
Engines, locomotive—2285—E. Slaughter and F. L. F. Caillet.
Engines, rotary steam and water power—2149—H. Bennison.
Fabrics, wadding, felt, and waterproof—2208—J. Shepherd.
Fencing, spinning or twisting wire for—2020—G. Bedson.
Fire-arms, breech-loading—2144—E. Petito.
Fire-arms, breech-loading—2145—T. Wilson.
Floor cloths, manufacture of—2271—J. B. Wood.
Gasaliers—2259—J. R. Cafferata.
Healds, making or knitting—2232—E. Higham and R. Kirk.
Hydrants or fire cocks—2277—R. Chrimes.
Inks or writing fluids, manufacture of—2223—H. C. Baildon.
Iron hollow ware, manufacture of—2238—S. J. Taylor.
Jacks, roasting—2234—J. M. Fisher.
Lifeboats—2146—J. White.
Lighting, gas and other fluids or liquids for—2050—J. J. Parkes.
Marine steam engines—2231—J. Dean.
Needles, manufacture of—2224—R. Schleicher.
Ovens, construction of, &c.—2253—A. M. Perkins.
Pumps, double action submerged force—2189—A. Moe.
Rags, &c., bleaching coloured—2157—W. L. Duncan and S. C. Child.
Railways, permanent way of—2004—S. C. Hemming.
Railway trains, communication between passengers and guard—2218—A. A. Davis.
Railway trains, communication between passengers and guard—2255—R. T. Hall.
Railway trains, communication between passengers and guard—2307—C. W. Howell.
Shafts or axles, anti-friction bearings for—2240—P. Skeldon.
Ships and vessels, arrangements for propelling—2265—F. Thornton.
Ships and vessels, construction of—2206—W. Coppin.
Ships, cleansing the bottoms of—2281—J. Harrison.
Ships, &c., construction of—2168—T. E. Symonds.
Silk waste, processes for treating, &c.—2297—C. F. M. Jessen.
Skates—2309—H. Rogers.
Steam engines, oscillating—2204—H. C. Lobnitz.
Sugar, manufacture of—2317—R. A. Brooman.
Syphon with a closing apparatus—2242—F. L. de Prebois.
Tar oils, treatment of—2279—D. H. Brandon.
Threshing and dressing machines—2202—A. Wallis and W. Drewett.
Tramways, &c.—2184—W. H. Ward.
Urinals—2194—T. Taylor.
Ventilating, fan to be employed for—2315—E. T. Hughes.
Vessels of war and fortifications, construction of—2167—W. Langham.
Water, machine for forcing up—2273—C. Stevens.
Wheel, screw and worm, &c., for propelling cars, carts, &c.—2155—N. Stubber.
Wheels—2295—R. W. Sievier.
Wind engines—2154—J. T. Hewes.

INVENTIONS WITH COMPLETE SPECIFICATIONS FILED.

Bedstead—2263—S. A. Baron.
Bed-table—2262—S. A. Baron.
Buttons, studs, &c., manufacture and fixing of—2325—G. G. Bussey.
Photographic pictures—2347—A. H. P. S. Wortley and W. W. Vernon.
Projectiles—2361—J. Mackay.
Ships, sheathing to iron or steel—2369—G. B. Cornish.

PATENTS SEALED.

643. E. Rowing.
804. W. Holbrook.
805. W. Holbrook.
809. J. Hicks.
810. J. Bullough.
812. A. Prince.
814. T. Coltman.
821. J. Hunt.
822. J. Capper.
825. E. Lindner.
826. W. Callcott.
827. R. J. Edwards.
828. E. U. Parod.
837. J. Smith.
842. E. K. Dutton.
845. J. N. Douglass.
847. A. McLaine.
850. J. Platt, E. Spencer, and J. Dodd.
856. E. T. Hughes.
861. W. T. C. Pratt.
863. J. H. Johnson.
867. F. Weintraud.
869. J. Snider, jun.
874. A. Rigg, jun.
875. C. Beard.
876. J. S. Richardson.
883. F. C. Goodwin.
889. A. Rodger.
897. A. B. Brown.
899. J. B. Thompson.
927. W. Reading.
950. G. W. Rendel.
959. W. Clark.
1002. J. Jones.
1157. J. H. Johnson.
1161. A. V. Newton.
1221. D. West.
1227. W. E. Newton.
1246. S. Foster and W. Rowden.
1365. A. V. Newton.
1424. J. H. Johnson.
1754. J. S. Tucker.
1826. J. and J. L. Hinks.

From Commissioners of Patents Journal, October 4th.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

2418. S. Rowsell.
2462. C. G. Hill.
2538. W. Clark.
2441. P. A. F. Bobœuf.
2464. W. T. Henley.
2466. T. Warwick.
2482. T. G. Ghislin.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

2557. R. H. Hughes.
2517. W. Henderson.
2521. E. Leigh.
2522. J. G. Jennings.
2523. J. M. Napier.
2558. J. Parker.
2531. P. Kerr.